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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SUCHFIELD, GEORGE A

ART UNIT	PAPER NUMBER
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3672

DATE MAILED: 04/18/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/841,299

Applicant(s)

DE ROUFFIGNAC ET AL.

Examiner

George Suchfield

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2270-2308 and 5396 is/are pending in the application.
- 4a) Of the above claim(s) 2273-2275 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2270, 2276-2308 and 5396 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 2270-2308 and 5396 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5, 6. 6) ☐ Other: \_\_\_\_\_

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1. This application contains claims directed to the following patentably distinct species of the claimed invention:

A. Heating a hydrocarbon formation using an electrical heater(s). Claim 2273 exemplify this species.

B. Heating a hydrocarbon formation using a surface burner(s). Claims 2274 exemplify this species.

C. Heating a hydrocarbon formation using a flameless distributed combustor(s). Claims 2275 exemplify this species.

D. Heating a hydrocarbon formation using a natural distributed combustor(s). Claims 2276 exemplify this species.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 2270-2272, 2277-2308 and 5396 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations

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of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2. During a telephone conversation with Eric B. Meyertons on April 5, 2002 a provisional election was made without traverse to prosecute the invention of Species D, claims 2276.

Affirmation of this election must be made by applicant in replying to this Office action. Claims 2273-2275 stand withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected species.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 2285-2288 and 2293 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

All these claims are indefinite because, insofar as a "hydrocarbon", by definition, comprises organic compounds consisting only of carbon and hydrogen, the recited "condensable hydrocarbons" cannot include nitrogen, oxygen, sulfur and/or oxygen-containing compounds.

Claims 2285-2287 appear further inaccurate with respect to the terms "nitrogen", "oxygen" and "sulfur", per se, because they are not even organic compounds, hydrocarbon or not. It appears that such terms/recitations should instead appear as, e.g., -- nitrogen compounds --.

Similarly with respect to claim 2293, hydrogen does comprise a hydrocarbon or "condensable hydrocarbon".

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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7. Claims 2270-2272, 2276-2308 and 5396 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2270-2308 of copending Application No. 09/841,284. Although the conflicting claims are not identical, they are not patentably distinct from each other because the hydrocarbon formation treated by the method of claim 2270 of this pending application is deemed broad enough to encompass or comprise the coal formation of claim 2270 of the copending application.

Claims 2270-2308 and 5396 appear to correspond to claims 2270-2308 of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

9. Claims 2270, 2272, 2276, 2304 are rejected under 35 U.S.C. 102(b) as being anticipated by Herzog (2,906,340).

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Herzog (col. 3, lines 28-62) clearly teaches that the in situ combustion of the formation increases the porosity thereof. The region of in situ combustion initiated and effected in the formation (15) is deemed to comprise a "heat source", as broadly recited in claim 2270.

Pyrolysis clearly occurs in the said formation, as called for in claim 2272.

Insofar as the in situ combustion may utilize petroleum which is naturally present, the point(s) of such combustion are deemed to comprise a "natural" distributed combustor, as called for in claim 2276, especially in the absence of any further step(s) associated therewith.

Regarding claim 2304, the Herzog process also increases the permeability of the formation.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2278-2281 and 2303 are rejected under 35 U.S.C. 103(a) as being unpatentable over Herzog (2,906,340).

The precise heating rate and thermal conductivity recited in claims 2278,2279 are deemed obvious matters of choice or design based on, e.g., the quality and amount of the in place crude oil present in the particular petroleum formation encountered in the field.

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Insofar as the petroleum formation (15) may be of low initial permeability and/or porosity, it is deemed that at least some transfer of heat by conduction from the point(s) of combustion will necessarily or obviously occur during the Herzog process, as called for in claim 2280.

The thermal conductivity recited in claim 2281 is deemed an obvious matter of choice or design based on, e.g., the quality and amount of the in place petroleum present and/or the matrix characteristics of the particular petroleum formation encountered in the field.

Regarding claim 2303, the Herzog process also increases the permeability of the formation; to increase the permeability to greater than 100 millidarcy would have been an obvious matter of choice in order to ensure adequate fluid flow through the formation.

12. Claims 2282-2295 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Herzog (2,906,340).

Regarding claims 2282-2295, it is deemed that the myriad hydrocarbon product mixtures recited in these claims would necessarily or obviously occur in carrying out the in situ combustion process of Herzog, i.e., the precise composition of the product fluids is seen as dictated by the particular petroleum or crude oil naturally occurring in the particular formation actually encountered in the field. Moreover, it would be an obvious matter of choice to operate the Herzog process to minimize what would be considered refinery contaminants, such as sulfur, nitrogen and/or oxygen in the product mixtures. Similarly, it would be obvious to reduce or minimize the amount of asphaltenes in the product mixtures for optimum downstream refining.



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Also, in the event that the particular crude oil deposit encountered yields ammonia gas, it would be an obvious expedient to utilize in a commercial process such as fertilizer production.

13. Claims 2270, 2272, 2304, 2307, 2308 are rejected under 35 U.S.C. 102(b) as being anticipated by Camacho et al (4,067,390).

Camacho et al (col. 7, line 32 - col. 8, line 3; col. 11, line 62 - col. 12, line 10) clearly teaches that the heating of the formation increases the porosity thereof. The plasma arc torch (25) is deemed to comprise the "heat source" of claim 2270.

Pyrolysis clearly occurs in the said formation, as called for in claim 2272.

Regarding claim 2304, the Camacho et al process also increases the permeability of the formation.

Regarding claims 2307 and 2308, Camacho et al (note Figure 8 and col. 9, lines 20-50) clearly discloses that the plasma arc torch heat sources (25) may be provided in a repeating triangular pattern

14. Claims 2278-2281, 2296-2299, 2303-2308 and 5396 are rejected under 35 U.S.C. 103(a) as being unpatentable over Camacho et al (4,067,390).

The precise heating rate and thermal conductivity recited in claims 2278, 2279 are deemed obvious matters of choice or design based on, e.g., the quality and amount of the in place hydrocarbon present in the particular hydrocarbon formation encountered in the field, consistent with objective of Camacho et al to provide a low rate of heating (col. 10, lines 34-40).

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Insofar as the hydrocarbon formation (11) may be of low initial permeability and/or porosity, it is deemed that at least some transfer of heat by conduction from the point(s) of combustion will necessarily or obviously occur during the Camacho et al process, as called for in claim 2280.

The thermal conductivity recited in claim 2281 is deemed an obvious matter of choice or design based on, e.g., the quality and amount of the in place hydrocarbon present and/or the matrix characteristics of the particular hydrocarbon formation encountered in the field.

The steps of 2296-2299,2305 such as controlling the heat or pressure in the formation, are deemed obvious matters of choice or design in carrying out the process of Camacho et al. In this regard, Camacho et al teaches that steam injection temperature, pressure and/or volume may be controlled in response to monitoring of the fluid products. In addition, overall operating conditions within the hydrocarbon formation may be altered (noted col. 5, lines 20-27) to vary the product fluid composition(s).

Regarding claim 2303, the Camacho et al process also increases the permeability of the formation; to increase the permeability to greater than 100 millidarcy would have been an obvious matter of choice in order to ensure adequate fluid flow through the formation.

Regarding claims 2306,2308 and 5396, Camacho et al in the embodiment of Figure 10 discloses that myriad heating wells (65) may surround a production well or shaft (74). The precise number of such heating wells provided, as called for in these claims, is deemed an obvious matter of choice or design in carrying out the process of Camacho et al based on, e.g., the overall

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areal extent of the hydrocarbon formation(s) encountered in exploiting an actual reservoir encountered in the field.

15. Claims 2282-2295 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Camacho et al (4,067,390).

Regarding claims 2282-2295, it is deemed that the myriad hydrocarbon product mixtures recited in these claims would necessarily or obviously occur in carrying out the heating process of Camacho et al, i.e., the precise composition of the product fluids is seen as dictated by the particular hydrocarbon naturally occurring in the particular formation actually encountered in the field. Moreover, it would be an obvious matter of choice to operate the Camacho et al process to minimize what would be considered refinery contaminants, such as sulfur, nitrogen and/or oxygen in the product mixtures. Similarly, it would be obvious to reduce or minimize the amount of asphaltenes in the product mixtures for optimum downstream refining. Also, in the event that the particular crude oil deposit encountered yields ammonia gas, it would be an obvious expedient to utilize in a commercial process such as fertilizer production.

16. Claim 2302 is rejected under 35 U.S.C. 103(a) as being unpatentable over Camacho et al (4,067,390) as applied to claim 2270 above, and further in view of Hoekstra et al (4,353,418) or Garrett (3,661,423).

It would have been obvious to one of ordinary skill in the art to which the invention pertains to hydrogenate the hydrocarbons produced from the heating process of Camacho et al, which hydrocarbons may be in liquid and/or vaporous form, with hydrogen also produced by the

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heating process of Camacho et al (col. 2, line 44-49), as taught by Hoekstra et al (note the Abstract and figure) or Garrett (col. 4, lines 50-54), in order to simultaneously provide an exemplary "non-energy use" for hydrogen produced by Camacho et al and improve the overall quality of the liquid and/or condensable hydrocarbon fluids produced by Camacho et al.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Of the cited references, it is noted that Tsai et al (4,299,285), Ljungstrom (2,923,535), Bridges et al (4,144,935) and Stresty et al (4,485,869) also disclose processes for increasing the porosity of a hydrocarbon formation via heating, and are thus cumulative to the references applied above against claim 2270. For example, note Bridges et al at col. 17, lines 15-38; Sresty et al at col. 9, lines 37-57; Tsai et al at col. 3, lines 20-45; and Ljungstrom at col. 3, lines 7-36.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Suchfield whose telephone number is (703) 308-2152, and is normally in the Office Monday through Friday, from 6:30 AM until 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell, can be reached on (703) 308-2151. The fax phone number for this Group is (703) 305-3597, (703) 305-7687 or (703) 306-4195.

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Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-2168.

gs/Suchfield  
April 16, 2002

  
George Suchfield  
Primary Examiner  
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